

AMENDMENTS TO THE CLAIMS:

This listing of the claims below will replace all prior versions and listing of claims in this application.

1. (Currently amended) A genetically modified plant cell having a reduced activity of at least one Class 3 branching enzyme in comparison with corresponding wild type plant cells that have not been genetically modified, wherein said plant cell comprises at least one foreign nucleic acid molecule which codes a class 3 branching enzyme, and wherein the class 3 branching enzyme has an iso-amylase domain (Pfam acc.: Pf02922) and an alpha-amylase domain (Pfam acc: Pf00128) which are separated from one another by at least 100 amino acids.
2. (Canceled)
3. (Canceled)
4. (Currently amended) The genetically modified plant cell according to Claim ~~3~~ 1, wherein said foreign nucleic acid molecule is
 - a) a nucleic acid molecule, which codes a protein with the amino acid sequence of Seq ID No. 4;
 - b) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least ~~80%~~ 50% with the amino acid sequence of SEQ ID NO: 4;
 - c) a nucleic acid molecule, ~~which includes~~ comprising the nucleotide sequence of Seq ID No. 3 or a complementary sequence thereof;
 - d) a nucleic acid molecule, the nucleic acid sequence of which has an identity of at least ~~80%~~ 50% with the nucleic acid sequences described under a) or c);
 - e) a nucleic acid molecule, which hybridizes with at least one strand of the nucleic acid molecules described under a) or c) under stringent conditions, wherein said stringent conditions are conducting the hybridization reaction at 65°C-68°C in a solution comprising 2X SSC 10X Denhardt solution (Ficoll 400+PEG+BSA; Ratio 1:1:1); 0.1% SDS; 5 mM EDTA; 50 mM Na₂HPO₄; 250 µg/ml herring sperm DNA; 50 µg/ml tRNA; or 25 M sodium phosphate buffer pH 7.2; 1 mM

EDTA; 7% SDS, and washing at 65°C-68°C in a solution comprising 0.2X SSC and 0.1% SDS;

- f) a nucleic acid molecule, the nucleotide sequence of which deviates from the sequence of the nucleic acid molecules identified under a), b), c), d), or e) ~~or f)~~ due to the degeneration of the genetic code; or
- g) a nucleic acid molecule, which represents fragments, allelic variants and/or derivatives of the nucleic acid molecules identified under a), b), c), d), e) or f).

5. (Currently amended) The genetically modified plant cell according to Claim 1 2, wherein said foreign nucleic acid molecule is

- a) a DNA molecule comprising the coding sequence of a class 3 branching enzyme, which codes at least one antisense RNA, which effects a reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme;
- b) a DNA molecule comprising the coding sequence of a class 3 branching enzyme, which by means of a co-suppression effect leads to the reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme;
- c) a DNA molecule, which codes at least one ribozyme, which splits specific transcripts of at least one endogenous gene, which codes a Class 3 branching enzyme;
- d) a DNA molecule, which simultaneously codes at least one antisense RNA and at least one sense RNA, wherein said antisense RNA and said sense RNA form a double-stranded RNA molecule, which effects a reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme, and wherein said DNA molecule comprises the coding sequence of a class 3 branching enzyme; or
- e) a nucleic acid molecule introduced by means of in vivo mutagenesis, which leads to a mutation or an insertion of a heterologous sequence in at least one endogenous gene coding a Class 3 branching enzyme, wherein the mutation or insertion effects a reduction in the expression of a gene coding a Class 3

branching enzyme or results in the synthesis of inactive Class 3 branching enzymes [[:]]

- ~~f) a nucleic acid molecule, which codes an antibody, wherein the antibody results in a reduction in the activity of a Class 3 branching enzyme due to the bonding to a Class 3 branching enzyme;~~
- ~~g) a DNA molecule, which contains transposons, wherein the integration of said transposons leads to a mutation or an insertion in at least one endogenous gene coding a Class 3 branching enzyme, which effects a reduction in the expression of at least one gene coding a Class 3 branching enzyme, or results in the synthesis of inactive Class 3 branching enzymes; or~~
- ~~h) a T-DNA molecule, which, due to insertion in at least one endogenous gene coding a Class 3 branching enzyme, effects a reduction in the expression of at least one gene coding a Class 3 branching enzyme, or result in the synthesis of inactive Class 3 branching enzyme.~~

6. (Previously presented) A plant cell according to Claim 1, which synthesizes a modified starch in comparison with corresponding wild type plant cells that have not been genetically modified.
7. (Currently amended) A plant ~~comprising~~ containing plant cells according to Claim 1.
8. (Previously presented) The plant according to Claim 7, which is a starch-storing plant.
9. (Previously presented) The plant according to Claim 8, which is a maize, rice, wheat, rye, oat, barley, cassava, potato, sago, mung bean, pea or sorghum plant.
10. (Previously presented) The plant according to Claim 8, which is a potato plant.
11. (Previously presented) Propagation material of plants according to Claim 7.
12. (Previously presented) Harvestable plant parts of plants according to Claim 7.
13. (Currently amended) A method for the manufacture of a genetically modified plant ~~according to Claim 7~~, comprising;

- a) genetically modifying a plant cell, by introducing at least one foreign nucleic acid molecule which codes a class 3 branching enzyme into the genome of the plant cell, wherein the class 3 branching enzyme has an iso-amylase domain (Pfam acc.: Pf02922) and an alpha-amylase domain (Pfam acc: Pf00128) which are separated from one another by at least 100 amino acids, whereby the genetic modification leads to the reduction of the activity of a Class 3 vegetable branching enzyme in comparison with corresponding wild type plant cells that have not been genetically modified;
 - b) regenerating a plant from plant cells from Step a); and
 - c) if necessary, producing further plants with the help of the plants according to Step b).
14. (Canceled)
15. (Currently amended) The method according to Claim ~~13~~ 44, wherein the said foreign nucleic acid molecule is
- a) a nucleic acid molecule, which codes a protein with the amino acid sequence of Seq ID No. 4;
 - b) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least ~~80%~~ 50% with the amino acid sequence of SEQ ID NO: 4;
 - c) a nucleic acid molecule ~~which includes~~ comprising the nucleotide sequence of Seq ID No. 3 or a complementary sequence thereof;
 - d) a nucleic acid molecule, the nucleic acid sequence of which has an identity of at least ~~80%~~ 50% with the nucleic acid sequences described under a) or c);
 - e) a nucleic acid molecule, which hybridizes with at least one strand of the nucleic acid molecules described under a) or c) under stringent conditions, wherein said stringent conditions are conducting the hybridization reaction at 65°C-68°C in a

solution comprising 2X SSC 10X Denhardt solution (Ficoll 400+PEG+BSA; Ratio 1:1:1); 0.1% SDS; 5 mM EDTA; 50 mM Na₂HPO₄; 250 µg/ml herring sperm DNA; 50 µg/ml tRNA; or 25 M sodium phosphate buffer pH 7.2; 1 mM EDTA; 7% SDS, and washing at 65°C-68°C in a solution comprising 0.2X SSC and 0.1% SDS;

- f) a nucleic acid molecule, the nucleotide sequence of which deviates from the sequence of the nucleic acid molecules identified under a), b), c), d), or e) ~~or f)~~ due to the degeneration of the genetic code; or
- g) a nucleic acid molecule, which represents fragments, allelic variants and/or derivatives of the nucleic acid molecules identified under a), b), c), d), e) or f).

16. (Currently amended) The method according to Claim 13 ~~14~~, wherein said foreign nucleic acid molecule is

- a) a DNA molecule comprising the coding sequence of a class 3 branching enzyme, which codes at least one antisense RNA, which effects a reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme;
- b) a DNA molecule comprising the coding sequence of a class 3 branching enzyme, which by means of a co-suppression effect leads to the reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme;
- c) a DNA molecule, which codes at least one ribozyme, which splits specific transcripts of at least one endogenous gene, which codes a Class 3 branching enzyme;
- d) a DNA molecule, which simultaneously codes at least one antisense RNA and at least one sense RNA, wherein said antisense RNA and the said sense RNA form a double-stranded RNA molecule, which effects a reduction in the expression of at least one endogenous gene, which codes a Class 3 branching enzyme, wherein

said DNA molecule comprises the coding sequence of a class 3 branching enzyme; or

e) a nucleic acid molecule introduced by means of in vivo mutagenesis, which lead to a mutation or an insertion of a heterologous sequence in at least one endogenous gene coding a Class 3 branching enzyme, wherein the mutation or insertion effects a reduction in the expression of a gene coding a Class 3 branching enzyme or results in the synthesis of inactive Class 3 branching enzymes [[:]]

~~f) a nucleic acid molecule, which codes an antibody, wherein the antibody results in a reduction in the activity of a Class 3 branching enzyme due to the bonding to a Class 3 branching enzyme;~~

~~g) a DNA molecule, which contains transposons, wherein the integration of said transposons leads to a mutation or an insertion in at least one endogenous gene coding a Class 3 branching enzyme, which effects a reduction in the expression of at least one gene coding a Class 3 branching enzyme, or results in the synthesis of inactive Class 3 branching enzymes; or~~

~~h) a T-DNA molecule, which, due to insertion in at least one endogenous gene coding a Class 3 branching enzyme, effects a reduction in the expression of at least one gene coding a Class 3 branching enzyme, or result in the synthesis of inactive Class 3 branching enzyme.~~

17. (Previously presented) The method according to Claim 13, wherein the genetically modified plant synthesizes a modified starch in comparison with corresponding wild type plants that have not been genetically modified.

18. (Currently amended) A nucleic acid molecule, coding for a protein with the enzymatic activity of a Class 3 branching enzyme, wherein the class 3 branching enzyme has an iso-amylase domain (Pfam acc.: Pf02922) and an alpha-amylase domain (Pfam acc: Pf00128) which are separated from one another by at least 100 amino acids, comprising

- a) a nucleic acid molecule, which codes a protein with the amino acid sequence of Seq ID No. 4;
 - b) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least 80% ~~70%~~ with the amino acid sequence of SEQ ID NO: 4;
 - c) a nucleic acid molecule, ~~which includes~~ comprising the nucleotide sequence of Seq ID No. 3 or a complimentary sequence thereof;
 - d) a nucleic acid molecule, which has an identity of at least 80% ~~70%~~ with the nucleic acid sequences described under a) or c);
 - e) a nucleic acid molecule, which hybridizes with at least one strand of the nucleic acid molecules described under a) or c) under stringent conditions, wherein said stringent conditions are conducting the hybridization reaction at 65⁰C-68⁰C in a solution comprising 2X SSC 10X Denhardt solution (Ficoll 400+PEG+BSA; Ratio 1:1:1); 0.1% SDS; 5 mM EDTA; 50 mM Na₂HPO₄; 250 µg/ml herring sperm DNA; 50 µg/ml tRNA; or 25 M sodium phosphate buffer pH 7.2; 1 mM EDTA; 7% SDS, and washing at 65⁰C-68⁰C in a solution comprising 0.2X SSC and 0.1% SDS;
 - f) a nucleic acid molecule, the nucleotide sequence of which deviates from the sequence of the nucleic acid molecules identified under a), b), c), d), or e) ~~or f)~~ due to the degeneration of the genetic code; or
 - g) a nucleic acid molecule, which represents fragments, allelic variants and/or derivatives of the nucleic acid molecules identified under a), b), c), d), e) or f).
19. (Previously presented) The nucleic acid molecule according to Claim 18, which codes a Class 3 branching enzyme of potato.
20. (Previously presented) A vector comprising a nucleic acid molecule according to Claim 18.

21. (Previously presented) The vector according to Claim 20, wherein the nucleic acid molecule is linked with regulatory sequences for transcription into prokaryotic or eukaryotic cells.
22. (Previously presented) A vector comprising a foreign nucleic acid molecule defined as in Claim 5 under a), b), c) or d).
23. (Previously presented) A host cell, which is genetically modified with a nucleic acid molecule according to Claim 18 or with a vector according to Claim 20.
24. (Withdrawn) A protein with the enzymatic activity of a Class 3 branching enzyme, comprising
 - a) a protein, which includes the amino acid sequence of SEQ ID No. 4, or
 - b) a protein, which has an identity of at least 70% with the amino acid sequence of the proteins identified under a).
25. (Withdrawn) The protein according to Claim 24, wherein the Class 3 branching enzyme comes from a potato plant.
26. (Withdrawn) A modified starch obtainable from a genetically modified plant according to Claim 7, from propagation material according to Claim 11, or from harvestable plant parts according to Claim 12.
27. (Canceled)
28. (Canceled)
29. (Canceled)
30. (Canceled)
31. (Canceled)
32. (Canceled)

33. (Canceled)
34. (Canceled)
35. (New) The genetically modified plant cell of claim 1, wherein the foreign nucleic acid molecule is
- a) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least 90% with the amino acid sequence of SEQ ID NO: 4; or
 - b) a nucleic acid molecule, which has an identity of at least 90% with the nucleic acid sequence of SEQ ID NO: 3 or a complement thereof.
36. (New) The genetically modified plant cell of claim 1, wherein the foreign nucleic acid molecule is
- a) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least 95% with the amino acid sequence of SEQ ID NO: 4; or
 - b) a nucleic acid molecule, which has an identity of at least 95% with the nucleic acid sequence of SEQ ID NO: 3 or a complement thereof.
37. (New) The genetically modified plant cell of claim 1, wherein the plant cell is a potato plant cell.
38. (New) The genetically modified plant cell of claim 1, wherein the nucleic acid molecule codes for a class 3 branching enzyme from potato.
39. (New) The method of claim 13, wherein the foreign nucleic acid molecule is
- a) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least 90% with the amino acid sequence of SEQ ID NO: 4; or
 - b) a nucleic acid molecule, which has an identity of at least 90% with the nucleic acid sequence of SEQ ID NO: 3 or a complement thereof.
40. (New) The method of claim 13, wherein the foreign nucleic acid molecule is
- a) a nucleic acid molecule, which codes a protein, the amino acid sequence of which has an identity of at least 95% with the amino acid sequence of SEQ ID NO: 4; or

b) a nucleic acid molecule, which has an identity of at least 95% with the nucleic acid sequence of SEQ ID NO: 3 or a complement thereof.

41. (New) The method of claim 13, wherein the plant cell is a potato plant cell.

42. (New) The method of claim 13, wherein the nucleic acid molecule codes for a class 3 branching enzyme from potato.